GEOSYNTHETIC RETAINING WALL
Classes 1 and 2 Non-aggressive Environments

Note 1: May be used for Class 1 and 2 walls and slopes in non-aggressive environments. Acceptability of the product for a specific contract bid item requires that the approved long-term geosynthetic strength as listed in Table 1 below meet or exceed the required long-term strength specified in the contract. The ultimate tensile strength listed in Table 1 is to be used for lot specific acceptance once the product arrives at the project site. (See Acceptance Code 1010)

Table 1. Long-term and ultimate strengths of geosynthetic products qualified for use in Classes 1 and 2 walls and reinforced slopes, non-aggressive environments.

Product	Ref. No.	T_{ult} (kN/m)	[2]Test Procedure for T_{ult}	[1]Long-Term Tensile Strength, T_{al} (kN/m)
Miragrid 5T, Machine Direction	1993-921	39.4	ASTM D4595	12.7
Miragrid 7T, Machine Direction	1993-921	56.9	ASTM D4595	18.4
Miragrid 8T, Machine Direction	1993-921	82.6	ASTM D4595	26.6
Miragrid 10T, Machine Direction	1993-921	108.9	ASTM D4595	37.6
Miragrid 5XT, Machine Direction	1993-921	51.4	ASTMD4595	18.2
Miragrid 7XT, Machine Direction	1993-921	58.6	ASTMD4595	20.8
Miragrid 8XT, Machine Direction	1993-921	85.3	ASTMD4595	30.2
Miragrid 10XT, Machine Direction	1993-921	115.3	ASTMD4595	40.9
Miragrid 12XT, Machine Direction	1993-921	92.8	ASTMD4595	35.7
Miragrid 18XT, Machine Direction	1993-921	136.6	ASTMD4595	52.5
Miragrid 20XT, Machine Direction	1993-921	181.3	ASTMD4595	69.7
Miragrid 22XT, Machine Direction	1993-921	259.2	ASTMD4595	99.7
Miragrid 24XT, Machine Direction	1993-921	370.4	ASTMD4595	142.5
Tensar UX1100SB (same as the previous designation UX1100HP), Machine Direction	1994-038	38.9	ASTM D4595	9.3
Tensar UX1400SB (same as the previous designation UX1400HP), Machine Direction	1994-038	54.0	ASTM D4595	14.4
Tensar UX1500SB (same as the previous designation UX1500HP), Machine Direction	1994-038	91.9	ASTM D4595	23.0
Tensar UX1600SB (same as the previous designation UX1600HP), Machine Direction	1994-038	110	ASTM D4595	30.6
Tensar UX1700SB (same as the previous designation UX1700HP), Machine Direction	1994-038	140	ASTM D4595	38.9
Tensar UX1100HS, Machine Direction	1994-038	39.4	ASTM D4595	10.9
Tensar UX1400HS, Machine Direction	1994-038	64.2	ASTM D4595	17.8
Tensar UX1500HS, Machine Direction	1994-038	101	ASTM D4595	28.9
Tensar UX1600HS, Machine Direction	1994-038	131	ASTM D4595	38.5
Tensar UX1700HS, Machine Direction	1994-038	158	ASTM D4595	47.9
Tensar UXMESA2, Machine Direction	1994-038	39.3	ASTM D4595	10.9
Tensar UXMESA3, Machine Direction	1994-038	64.1	ASTM D4595	17.8
Tensar UXMESA4, Machine Direction	1994-038	101	ASTM D4595	28.9
Tensar UXMESA5, Machine Direction	1994-038	131	ASTM D4595	38.5
Tensar UXMESA6, Machine Direction	1994-038	157	ASTM D4595	47.6

[1]T_{al} is determined at a design life of 75 years.

[2]ASTM D4595 shall be modified to address geogrids as follows: The minimum specimen width shall be 200 mm (8 in.) with a minimum gauge length of 100 mm (4 in.). The gauge length shall be a minimum of two grid apertures long. The gauge length shall be in increments of whole grid apertures. For the purpose of calculating tensile strength, the specimen width shall be considered to be the distance between the outermost ribs of the specimen as measured at the midpoint of those ribs plus the average center to center spacing between ribs.

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Table 1. Long-term and ultimate strengths of geosynthetic products qualified for use in Classes 1 and 2 walls and reinforced slopes, non-aggressive environments.

Product	Ref. No.	T_{ult} (kN/m)	[2]Test Procedure for T_{ult}	[1]Long-Term Tensile Strength, T_{al} (kN/m)
Tensar BX1100, Machine Direction	1994-038	12.4	ASTM D4595	1.65
Tensar BX1100, X-Machine Direction	1994-038	19.0	ASTM D 4595	2.55
Tensar BX1200, Machine Direction	1994-038	17.5	ASTM D4595	2.45
Tensar BX1200, X-Machine Direction	1994-038	28.8	ASTM D4595	4.00
Raugrid 2/2-20, Machine Direction	1999-042	19.1	ASTM D4595	8.0
Raugrid 2/3-30, Machine Direction	1999-042	20.7	ASTM D4595	8.6
Raugrid 3/2-15, Machine Direction	1999-042	36.7	ASTM D4595	15.3
Raugrid 3/3-20, Machine Direction	1999-042	32.9	ASTM D4595	13.7
Raugrid 4/2-15, Machine Direction	1999-042	42.6	ASTMD4595	17.8
Raugrid 6/3-15, Machine Direction	1999-042	58.3	ASTMD4595	24.3
Raugrid 6/6-15, Machine Direction	1999-042	58.5	ASTMD4595	24.4
Raugrid 8/3-20, Machine Direction	1999-042	78.5	ASTMD4595	32.7
Raugrid 10/3-20, Machine Direction	1999-042	97.0	ASTMD4595	40.4
Stratagrid 100, Machine Direction	1999-030	17.5	ASTMD4595	7.3
Stratagrid 100, X-Machine Direction	1999-030	10.2	ASTMD4595	4.3
Stratagrid 200, Machine Direction	1999-030	39.7	ASTMD4595	16.5
Stratagrid 200, X-Machine Direction	1999-030	23.4	ASTMD4595	9.7
Stratagrid 300, Machine Direction	1999-030	43.8	ASTMD4595	18.3
Stratagrid 300, X-Machine Direction	1999-030	14.6	ASTMD4595	6.1
Stratagrid 500, Machine Direction	1999-030	67.1	ASTMD4595	28.0
Stratagrid 500, X-Machine Direction	1999-030	26.3	ASTMD4595	10.9
Stratagrid 550, Machine Direction	1999-030	91.1	ASTMD4595	37.9
Stratagrid 550, X-Machine Direction	1999-030	26.3	ASTMD4595	10.9
Stratagrid 600, Machine Direction	1999-030	108	ASTMD4595	45.0
Stratagrid 600, X-Machine Direction	1999-030	26.3	ASTMD4595	10.9
Amoco 2044, Machine Direction	1999-051	70.0	ASTMD4595	8.3
Amoco 2044, X-Machine Direction	1999-051	70.0	ASTMD4595	14.3
Sympaforce SF35, Machine Direction	2000-058	38.3	ASTMD4595	15.3
Sympaforce SF55, Machine Direction	2000-058	55.1	ASTMD4595	23.0
Sympaforce SF80, Machine Direction	2000-058	82.1	ASTMD4595	34.2
Sympaforce SF110, Machine Direction	2000-058	149	ASTMD4595	62.1

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Classes 1 and 2 Non-aggressive Environments

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Table 1. Long-term and ultimate strengths of geosynthetic products qualified for use in Classes 1 and 2 walls and reinforced slopes, non-aggressive environments.

Product	Ref. No.	T_{ult} (kN/m)	[2]Test Procedure for T_{ult}	[1]Long-Term Tensile Strength, T_{al} (kN/m)
ParaGrid 30/15 Machine Direction	2001-063	30	ASTMD4595	14.6
ParaGrid 50/15 Machine Direction	2001-063	60	ASTMD4595	24.4
ParaGrid 80/15 Machine Direction	2001-063	80	ASTMD4595	39.0
ParaGrid 100/15 Machine Direction	2001-063	100	ASTMD4595	48.8
ParaGrid 150/15 Machine Direction	2001-063	150	ASTMD4595	73.2
ParaGrid 200/15 Machine Direction	2001-063	200	ASTMD4595	97.6
Fortrac 20/13-20 Machine Direction	2002-073	21.9	ASTMD4595	10.4
Fortrac 20/13-20 X-Machine Direction	2002-073	10.4	ASTMD4595	5.0
Fortrac 35/20-20 Machine Direction	2002-073	35.0	ASTMD4595	17.5
Fortrac 35/20-20 X-Machine Direction	2002-073	20.2	ASTMD4595	10.1
Fortrac 55/30-20 Machine Direction	2002-073	54.1	ASTMD4595	27.1
Fortrac 55/30-20 X-Machine Direction	2002-073	27.8	ASTMD4595	13.9
Fortrac 80/30-20 Machine Direction	2002-073	78.5	ASTMD4595	39.3
Fortrac 80/30-20 X-Machine Direction	2002-073	28.0	ASTMD4595	14.0
Fortrac 110/30-20 Machine Direction	2002-073	108.1	ASTMD4595	54.1
Fortrac 110/30-20 X-Machine Direction	2002-073	27.3	ASTMD4595	13.7

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Note 2: May be used for Class 2 walls and slopes in non-aggressive environments. Acceptability of the product for a specific contract bid item requires that the approved long-term geosynthetic strength as listed in Table 2 below meet or exceed the required long-term strength specified in the contract. The ultimate tensile strength listed in Table 2 is to be used for lot specific acceptance once the product arrives at the project site. (See Acceptance Code 1010)

Table 2. Long-term and ultimate strengths of geosynthetic products qualified for use in Class 2 walls and reinforced slopes, non-aggressive environments.

Product	Ref. No.	T_{ult} (kN/m)	[2]Test Procedure for T_{ult}	[1]Long-Term Tensile Strength, T_{al} (kN/m)
Mirafi HP565 - Machine Direction	1993-920	61.3	ASTM D4595	8.76
Mirafi HP565 - Cross Machine Direction	1993-920	65.7	ASTM D4595	9.39
Mirafi HP570 - Machine Direction	1993-920	70.1	ASTM D4595	10.0
Mirafi HP570 - Cross Machine Direction	1993-920	70.1	ASTM D4595	10.0
Mirafi HP1250X - Machine Direction	1993-920	158	ASTM D4595	22.6
Mirafi HS400 - Machine Direction Cross-Machine Direction	1993-920	70.0 70.0	ASTMD4595	10.0 10.0
Mirafi HS600 Machine Direction Cross-Machine Direction	1993-920	105 78.8	ASTMD4595	15.0 11.3
Mirafi HS800 Machine Direction Cross-Machine Direction	1993-920	140 96.3	ASTMD4595	20.0 13.8
Mirafi HS1150 Machine Direction Cross-Machine Direction	1993-920	201 105	ASTMD4595	28.7 15.0
Mirafi HS1400 Machine Direction Cross-Machine Direction	1993-920	245 102	ASTMD4595	35.0 14.6
Mirafi HS1715 Machine Direction Cross-Machine Direction	1993-920	300 105	ASTMD4595	42.9 15.0
Mirafi HS2400 Machine Direction Cross-Machine Direction	1993-920	420 105	ASTMD4595	60.0 15.0
Mirafi HS3000 Machine Direction Cross-Machine Direction	1993-920	525 158	ASTMD4595	75.0 22.6
Mirafi HS3600 Machine Direction	1993-920	630	ASTMD4595	90.0
GEOTEX Style 4x4 Machine and X-Machine Direction	1994-036	70.0	ASTM D4595	10.0
GEOTEX Style 4x6 Machine Direction	1994-036	70.0	ASTM D4595	10.0
GEOTEX Style 4x6 X-Machine Direction	1994-036	105	ASTM D4595	15.0

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